IEEE 802.11b
Cardbus Adapter

User's Manual

Regulatory Notes and Statements

Health and Authorization for Use

Radio frequency electromagnetic energy is emitted from the Wireless LAN device. The energy levels of these emissions are much less than the electromagnetic energy emissions from wireless devices such as cell phones. Wireless LAN devices are safe for use and meet the frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments such as:

- On board of airplanes, or
- In an explosive environment, or
- In case the interference risk to other devices or services is perceived or identified as harmful

If the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings, etc.) is not clear, please ask for authorization to use these devices prior to operating the equipment.

Regulatory Information/Disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device and of any substitution or attachment. The manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failure to comply with these guidelines.

USA-FCC (Federal Communications Commission) Statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause interference, and

2. This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Radio Frequency Exposure Statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65 and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized.

When nearby persons has to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Export restrictions

This product or software contains encryption code that may not be exported or transferred from the US or Canada without an approved US Department of Commerce export license.

Safety Information

Your device contains a low power transmitter. When the device is transmitted, it sends out radio frequency (RF) signal.

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference which the user may be required to take adequate measures.

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OVERVIEW OF THIS USER'S MANUAL

Introduction: Describes the Wireless Cardbus Adapter.

Unpacking and Setup: Helps you to get started with the basic installation of the Wireless Cardbus Adapter.

Software Installation: Guides you to install the Utility software.

Hardware Installation: Guides you to install the Cardbus and driver.

Utility Settings: Guides you to configure the Utility software settings.

Technical Specifications: Lists the technical (general, physical, and environmental) specifications of the Wireless Cardbus Adapter.

Introduction

Congratulations on your purchase of this IEEE 802.11b Wireless Cardbus Adapter.

This manual helps you to become familiar with the Wireless Cardbus Adapter and contains detailed instructions about the operation of this product. Please keep this manual for future reference.

With a Wireless (IEEE 802.11b) Cardbus Adapter, a laptop computer or a station can communicate with another computer wirelessly. Easy-to-use utilities are bundled with the Wireless Cardbus Adapter for configuration, monitoring, and diagnostic purposes.

The Wireless Cardbus Adapter can transmit and receive data at a speed of up to 11 Megabits per second (Mbps). With the Wireless Cardbus Adapter, you can connect your Notebook PC or station to a wireless network wherever there is an adequate signal without the need of cables.

The Wireless Cardbus Adapter provides users with access to real-time information anywhere in their organization. This mobility provides additional productivity and service, which are not available under wired networks. The Wireless Cardbus Adapter configuration is easy to change from peer-to-peer network that are suitable for small number of users, to full infrastructure network that consists of thousands of users.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Wireless Cardbus Adapter.

Unpacking

Open the box of the Wireless Cardbus Adapter and carefully unpack it. The box should contain the following items:

- One 802.11b Wireless Cardbus Adapter
- One Driver & Utility CD-ROM
- One Quick Installation Guide

If any item is found missing or damaged, please contact your local reseller for replacement.

Setup

The setup of the Wireless Cardbus Adapter can be performed using the following steps:

- Visually inspect the Cardbus Adapter, but **do not** insert it into the Cardbus slot before installing the software from the provided CD-ROM.
- Make sure the laptop or computer is in an open area with as little radio interference with other nearby radio signal devices (e.g. cordless phones, microwave oven, etc.) as possible.

SOFTWARE INSTALLATION

This section guides you to install the WLAN Cardbus Utility Software for the Wireless Cardbus Adapter.

Install the WLAN Cardbus Utility Software

1. Insert the Wireless Cardbus Adapter Driver & Utility CD-ROM into the CD-ROM drive and click **Install Software** at the setup menu. *See Fig. 1.1*

Note: In some cases, you may need to start the software manually by going to **Start**, **Run**, and type `D:\Utility\Setup.exe` (where D is the letter of your CD-ROM drive) and click **OK**.

Fig.1.1

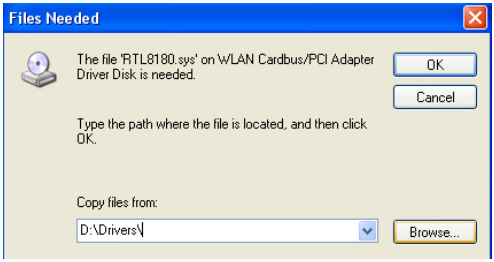
2. The InstallShield Wizard screen will appear. Click **Next** to continue.
3. Follow the on-screen instructions to install the utility software.
4. Click **Finish** to complete the installation. Restart the computer if you are prompted to do so.

HARDWARE INSTALLATION

Install Cardbus and Driver

1. Once the computer is restarted, insert the Cardbus into the Cardbus slot. The **Found New Hardware Wizard** will appear.
2. Select **Install the software automatically** and click **Next**.
3. If you are prompted for the location of the driver, browse to the **Drivers** folder on your CD-ROM drive or type `D:\Drivers\` (where D is the letter of your CD-ROM drive) and click **OK**. *See Fig. 2.1*

Note: For Windows XP/2000, click **Continue Anyway** or **Yes** if the Windows logo compatibility message appears.


Files Needed
The file 'RTL8180.sys' on WLAN Cardbus/PCI Adapter Driver Disk is needed.
OK
Cancel
Type the path where the file is located, and then click OK.
Copy files from:
D:\Drivers\
Browse...
Fig. 2.1

4. Click **Finish** to complete the driver installation.

LED Indicator

PWR (POWER)

The PWR indicator lights green when the Wireless Cardbus Adapter is receiving power, otherwise, it is off.

LNK (LINK)
The LNK indicator lights green when the Wireless Cardbus Adapter is connected to a network successfully. Otherwise the LNK indicator blinks on and off for three seconds while the Cardbus is scanning for any available wireless network.

Check the Installation

The LEDs of the Wireless Cardbus Adapter are clearly visible, and the status of the network link can be seen instantly:

1. Once the Cardbus is plugged into the computer's Cardbus slot, the PWR LED will light up indicating a normal status.
2. When the Cardbus and its driver are installed, the LNK LED will start blinking on and off for three seconds as the Cardbus scans for any available wireless network.
3. While the Cardbus is connected to an Access Point or to another wireless client, the LNK LED will remain lit.
4. After all the installations are completed, and the Cardbus is plugged into the computer, you will see the WLAN Cardbus Utility icon in the Windows system tray. *See Fig 2.2*

Fig 2.2

A green utility icon indicates the Cardbus is successfully connected to a network. A red utility icon indicates the Cardbus is not connected to any network.

WLAN CARDBUS UTILITY SETTING

With the WLAN Cardbus Utility, you can configure all the functions of the Cardbus. Double-click the utility icon in the Windows system tray to open the Utility software.

Note: Windows XP provides its own **Wireless Zero Configuration Utility**. When it is enabled, it will override the management of the WLAN Cardbus Utility. To disable the Windows XP utility and allow the WLAN Cardbus Utility to manage your Cardbus, perform the following steps:

1. Double-click the Windows XP network icon and click **Advanced** (or **Properties**). *See Fig 3.1*

Fig 3.1

2. On the **Wireless Networks** tab, uncheck the **Use Windows to configure my wireless network settings** box and click **OK**.

The WLAN Cardbus Utility includes seven tabs: **Status**, **Configuration**, **Advanced**, **Profile**, **Network**, **Statistics**, and **About**.

Status Tab

The Status tab displays the status of the Cardbus. The upper part of the window shows which wireless device the Cardbus is connected to as well as the current network mode, channel, transmit rate, and encryption setting. The lower part of the window displays the current data transmitted and received along with the signal strength and link quality. *See Fig. 3.2*

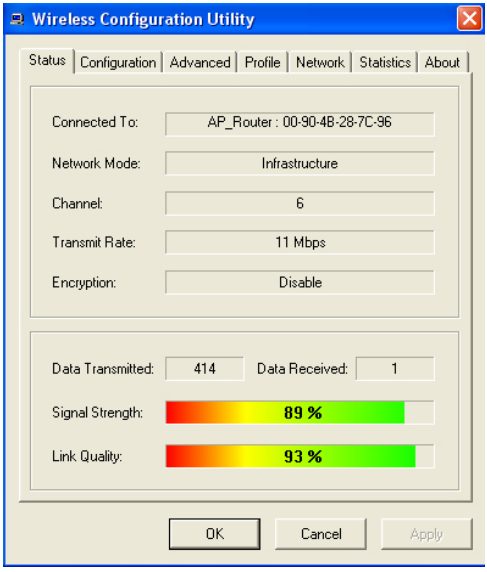


Fig. 3.2

Configuration Tab

The Configuration tab allows you to configure network and security settings. *See Fig. 3.3*

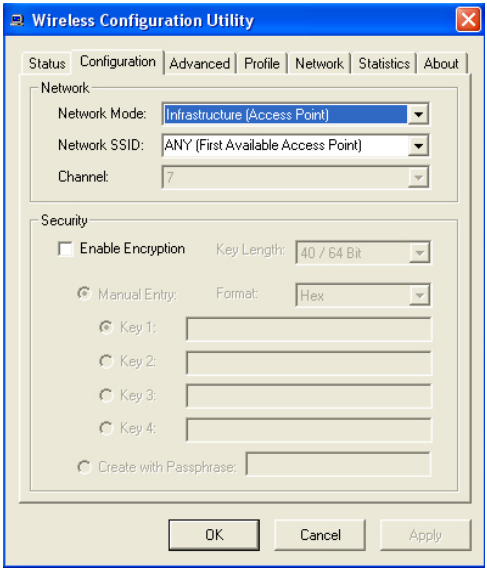


Fig 3.3

Network

Network Mode: Select **Infrastructure (Access Point)** for connecting to an Access Point, or select **802.11 Ad-Hoc** for using computer-to-computer connection.

Network SSID: Enter or select the SSID of the network that you wish to join. The SSID distinguishes one WLAN group from another, so all access points and all devices attempting to connect to a specific WLAN group must use the same SSID. If the SSID field is set to "**ANY**", it will detect the strongest signal from any available wireless network.

Channel: Displays the channel number that is currently being used by the Cardbus. The channel number can only be set under the Ad-Hoc mode. In Ad-Hoc mode, each client must have the same channel number and SSID in order to connect to each other properly. In Infrastructure mode, the Cardbus will automatically detect and use the channel number provided by the Access Point.

Security: Data encryption provides security to your wireless connection and prevents unauthorized access to your network. *See. Fig 3.3*.

1. Select the **Enable Encryption** check box to enable data encryption.
2. Choose the applicable key length and format and enter the key values in one of the four spaces provided.

- If you use **40/60 Bit** key length with **Hex** format, you must enter **10** characters ranging from the numbers 0 through 9 and the letters A through F in any combination.

- If you use **40/60 Bit** key length with **ASCII** format, you must enter **5** alphanumeric characters in any combination.

- If you use **128 Bit** key length with **Hex** format, you must enter **26** characters ranging from the numbers 0 through 9 and the letters A through F in any combination.

- If you use **128 Bit** key length with **ASCII** format, you must enter **13** alphanumeric characters in any combination.

Note: When setting WEP keys for data encryption, all the wireless clients and/or Access Points must use the same encryption key values. For example, if you use Key 1 on your Cardbus and assigned a certain value to it, then the same value must be assigned to Key 1 for all the clients and/or Access Points in your wireless network.

Create with Passphrase: When you enter any alphanumeric values in this field, the utility will automatically create four keys in Hex values for you.

***Note*:** After all the settings are completed, click **Apply** to save the settings.

Advanced Tab

The Advanced tab allows you to further fine-tune the network settings of your cardbus. *See Fig 3.4*

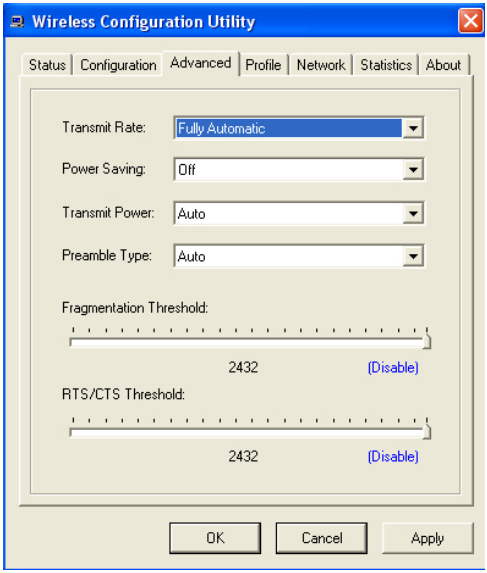


Fig 3.4

Transmit Rate: Choose one of the data transmission rate: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps, and Fully Automatic. The Fully Automatic mode will automatically detect the suitable transfer rate and auto fall back when the signal is not as strong. It will auto fall back to the highest transmission rate possible.

Power Saving: Set the power saving mode to **Off**, **Normal**, or **Maximum**.

Transmit Power: Set the transmit power to **Minimum**, **12.5%**, **25%**, **50%**, **100%**, or **Auto**.

Preamble Type: Select from **Auto**, **Long Tx Preamble**, and **Short Tx Preamble**. The use of Preamble is to limit the data packet size during transmission. It is recommended that you use short preamble when the link quality is bad.

Fragment Threshold: Choose a setting within the range of 256 to 2432 bytes. The fragment threshold determines the size of the packet that will be transmitted in fragments. It is recommended to fragment the packet when the link quality is bad.

RTS/CTS Threshold: The purpose of RTS/CTS is to minimize collisions among hidden stations. Choose a setting within the range of 256 to 2432 bytes.

Profile Tab

The Profile tab allows you to set values for all configuration settings and save them as a profile. After you have set all the desired settings for a profile, enter a name in the **Profile Name** field and click **Save** and **Apply**. You can choose to use a different profile by using the drop-down menu in the **Profile Name** field, select the desired profile, and click **Activate**. You can also delete a profile by selecting it and click **Delete**. *See Fig. 3.5*

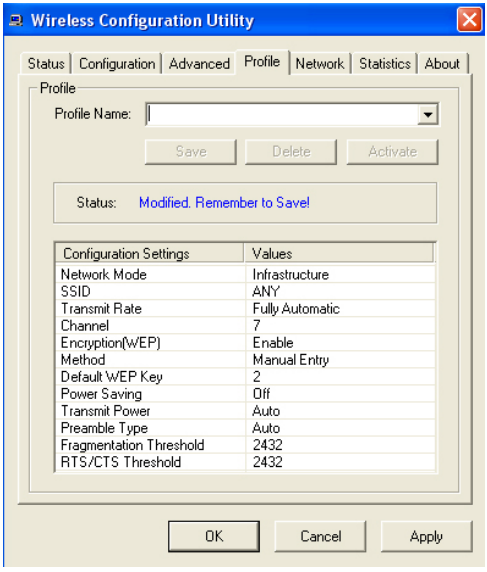


Fig 3.5

Network Tab

The Network tab displays all the Wireless devices around your Wireless Cardbus Adapter. The information of the wireless devices includes the SSID, MAC Address, Channel, Signal, WEP type, and Network mode.

You can click the **Rescan** button to find any new wireless device and double-click the device that you want to connect to. *See Fig. 3.6*

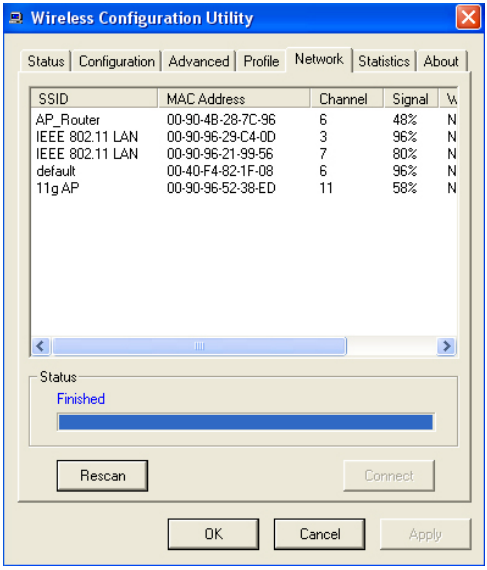


Fig. 3.6

Statistics Tab

The Statistics tab shows the real-time transmission and reception performance of the Cardbus. *See Fig. 3.7*

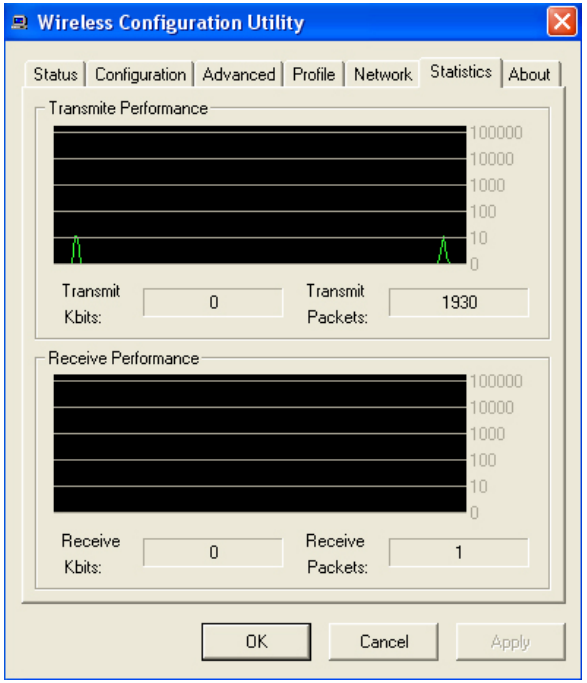


Fig 3.7

About Tab

The About tab shows the Device Name, Regulatory Domain, Driver Version, MAC Address, and the Utility version. *See Fig. 3.8*

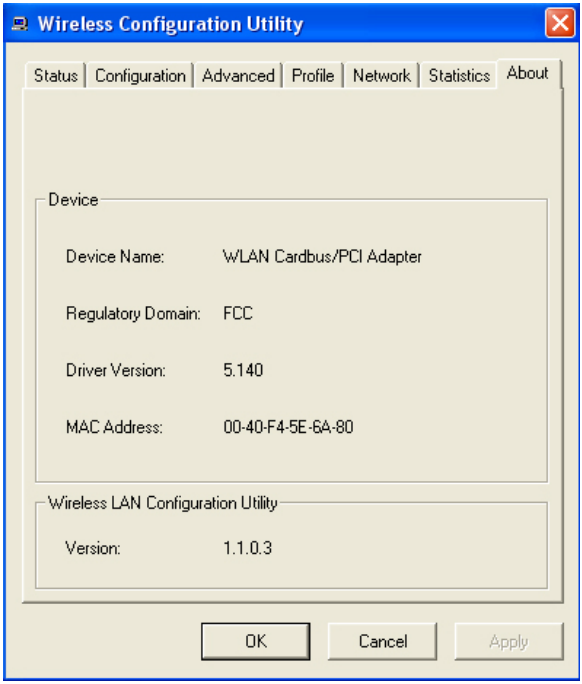


Fig 3.8

TECHNICAL SPECIFICATIONS

Gener l	
Radio Technology	IEEE 802.11b Direct Sequence Spread Spectrum (DSSS)
Interface	Cardbus Type II specification 32bit data bus
Data Transfer Rate	1, 2, 5.5, 11Mbps (auto sense)
Receiver Sensitivity	11Mbps: Typical -80dBm @ 8% PER (Packet Error Rate) 2Mbps: Typical -87dBm @ 8% PER (Packet Error Rate)
Frequency Range	2400 ~ 2497 MHz ISM band (channels 1 ~ 14)
Modulation Schemes	DBPSK/DQPSK/CCK
Channels	1~11 channels (FCC), 1~13 channels (ETSI), 1~14 channels (MKK-Japan), 10~13 channels (France), 3~9 channels (Israel)
Media Access Protocol	CSMA/CA with ACK
Security	64/128-bits WEP Encryption
Diagnostic LED	PWR (Power) & LNK (Link status)
Antenna	Integrated Microstrip dual diversity antennas
Physical and En ironmental	
Driver Support	Windows 98(SE), Windows ME, Windows 2000, Windows XP
Continuous Current Consumption	250mA typ. for receive mode, 450mA typ. for transmit mode
Temperature	Operating: 0° ~ 40° C, Storage: -25° ~ 70° C
Humidity	10% ~ 95% RH, no condensation
Dimensions	86 x 61 x 14 mm (W x H x D)
Certifications	FCC Part 15.247 for US, ETS 300 328 for Europe

APPENDIX A

This appendix lists the IEEE 802.11b channels supported by the world's regulatory domains as well as the maximum power levels allowed per domain.

Regulatory Domains

Channel Identifier	802.11b Frequency	Regulatory Domains				
		FCC (North America)	ETSI (Europe)	France	Israel	MKK (Japan)
1	2412	X	X			X
2	2417	X	X			X
3	2422	X	X		X	X
4	2427	X	X		X	X
5	2432	X	X		X	X
6	2437	X	X		X	X
7	2442	X	X		X	X
8	2447	X	X		X	X
9	2452	X	X		X	X
10	2457	X	X	X		X
11	2462	X	X	X		X
12	2467		X	X		X
13	2472		X	X		X
14	2484					X

Some European countries may have their own domains. Users are responsible for ensuring that the channel set configuration is in compliance with the regulatory standards of those countries.

Maximum Power Levels

Regulatory Domain	Antenna Gain (dBi)	Maximum Power Level (mW)
Americas (FCC)	0	100
	2	100
Europe (ETSI)	0	100
	2	50
Israel	0	100
	2	50
Japan (MKK)	0	100
	2	50